Inside Wallops

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NASA Data Shows Hurricanes Help Plants Bloom In "Ocean Deserts"

Whenever a hurricane races across the Atlantic Ocean, chances are phytoplankton will bloom behind it. According to a new study using NASA satellite data, these phytoplankton blooms may also affect the Earth's climate and carbon cycle.

Dr. Steven Babin, a researcher at the Johns Hopkins University Applied Physics Laboratory in Laurel, Md., studied 13 North Atlantic hurricanes between 1998 and 2001.

Ocean color data from the SeaWiFS instrument on the SeaStar satellite were used to analyze levels of chlorophyll, the green pigment in plants. The satellite images showed tiny microscopic ocean plants, called phytoplankton, bloomed following the storms.

"Some parts of the ocean are like deserts, because there isn't enough food for many plants to grow. A hurricane's high winds stir up the ocean waters and help bring nutrients and phytoplankton to the surface, where they get more sunlight, allowing the plants to bloom," Babin said.

Previous research has relied largely on sporadic, incomplete data from ships to understand how and when near-surface phytoplankton bloom.

"This effect of hurricanes in ocean deserts has not been seen before. We believe it is the first documented satellite observation of this phenomenon in the wake of hurricanes," Babin noted. "Because 1998 was the first complete Atlantic hurricane season observed by this instrument, we first noticed this effect in late 1998 after looking at hurricane Bonnie," Babin said.

The study found the physical make-up of a storm, including its size, strength and forward speed, is directly related to the amount of phytoplankton that blooms. Bigger storms appear to cause larger phytoplankton blooms. Larger phytoplankton should have more chlorophyll, which satellite sensors can see.

Hurricane-induced upwelling, the rising of cooler nutrient- rich water to the ocean surface, is also critical in phytoplankton growth.

For two to three weeks following almost every storm, the satellite data showed phytoplankton growth.

Babin and his colleagues believe it was stimulated by the addition of nutrients brought up to the surface.

Whenever the quantity of plants increases or decreases, it affects the amount of carbon dioxide in the atmosphere.

As phytoplankton grow, they absorb carbon dioxide, a heat- trapping greenhouse gas. The gas is carried to the ocean floor as a carbon form when the tiny plants die. This enables atmospheric carbon to get into the deep ocean. It is one of several natural processes that contribute to Earth's carbon cycle.

By stimulating these phytoplankton blooms, hurricanes can affect the ecology of the upper ocean.

Phytoplankton is at the bottom of the food chain. The factors that influence their growth also directly affect the animals and organisms that feed on them.

In addition, since climate-related phenomena like El Niño may change the frequency and intensity of hurricanes, storm-induced biological activity may have even greater contributions to future climate change.

Scientists are still trying to determine how much carbon dioxide might be removed from such a process.

"Better knowledge of the carbon cycle will improve our understanding of global ecology and how climate change might affect us," Babin said.

The research appeared as a paper in a recent issue of the Journal of Geophysical Research-Oceans. Study co-authors include J.A. Carton, University of Maryland, College Park, Md.; T.D. Dickey, Ocean Physics Laboratory, University of California, Santa Barbara, Calif.; and J.D. Wiggert, Center for Coastal Physical Oceanography, Old Dominion University, Norfolk, Va.

Wallops Shorts.....

In the News

Eastern Shore News
"Students Participate in NASA Launch Today at Wallops"

Eastern Shore News
"June Events at the NASA Visitor Center"

Eastern Shore News
"Navy Planning Radar Test Facility at Wallops Island"

Wallops Plays Key Role in Joint Military Exercise

"As one of the most frequently deployed units in the Air Force, U-2 personnel are stretched very thin. However, through NASA's support, the U-2 aircraft was able to participate in the Combined Joint Task Force Exercise, (CJTFEX) with only a skeleton crew.

What is new and exciting about this exercise is the opportunity to work so closely with NASA.

Everything we have asked for, NASA promptly provided. The whole base has been great. I would specifically like to highlight Robert Hurley, the NASA CJTFEX Program Manager. Rob was out there for every launch, recovery and meeting. He truly was the key to success in this exercise.

This June, when B-1, B-2, B-52, F-15, F-16, F-18 and A-10 aircraft struck targets in the bombing ranges along the East Coast, a single-manned, black aircraft from NASA Wallops Island flew high above them passing the critical information they needed to strike hard and fast....."

Major Shane Johnson
CJTFEX U-2 Operations Officer

Employee Appreciation Picnic at the Pavilion

Free Food and Entertainment
June 23
11 a.m. to 1 p.m.

Wallops managers will be cooking all the food.

The Wallops Music Club will perform

HyTEx Team Receives Certificates

NASA Marshall Space Flight Center (MSFC) recognized 27 NASA Wallops Flight Facility employees on June 15 for their contributions on the Hypersonic Technology Experiment (HyTEx) Project.

The HyTEx project, managed by MSFC, was to launch a hypersonic re-entry vehicle test bed from Wallops Flight Facility on a three-stage Talos-Oriole-Oriole sounding rocket and reach a speed of Mach 6.5 at 518 miles down-range in July 2005.

The Wallops team was responsible for design of the launch vehicle, the ascent shroud, launch operations and launch range, and mid-air recovery of the hypersonic reentry vehicle. A Preliminary Design Review was held at Marshall Space Flight Center on March 11.

On March 17, NASA Headquarters, Office of Exploration Systems, (Code T), cancelled the HyTEx project due to changing funding priorities.

HyTEx Project Manager, Jimmy Lee, and Flight Systems Manager, Deborah Bagdigian, MSFC, Space Transportation Directorate along with HyTEx Platform Integration Manager, Jimmie Johnson, MSFC, Flight Projects Directorate presented a framed certificate to each of the Wallops team members. The certificates included a small American flag that had flown aboard the Orbiter Endeavor STS-108 mission in December 2001.

The following Wallops employees received the certificates:
John Dickerson, Rob Hurley, Steve Kremer, Chris Shreves, Steve Skees, Ron Walsh, Tripp Ransone, Brett Vincent, Bobby Flowers, Hayden Gordon, Wayne Borrmann, Jackie Parks, Charley Snedeker, Zeb Barfield, Jr., Chris Bradley, Walt Costello, Brian Creighton, Mike Disbrow, Gerry Doyon, Tracy Gibb, Andy Groves, Dave Krause, Charlie Lankford, John McDaniel, Bruce Scott, Jay Scott, Mark Simko

Cub Scouts Visit Wallops

Bob Marshall Photo

Members of Cub Scout Pack 253 from East Norwich, Oyster Bay, Long Island, N.Y., visited Paul Salyers, DYNCO, (center), in the Wallops Control Tower during their recent Space Academy adventure.

Book Exchange in the Wallops Library

Building E-105

Running out of room in your attic, basement, or garage? Bring unwanted books to the Library and pick up something new!

Non-fiction, Fiction, Crafts, Cookbooks, Children's books, How-To

Read it · Keep it · Return it · Recommend it · Recycle it!

Questions? Call x1065

EAP Lunch & Learn Addiction Revisited

When: Tuesday, June 22
Where: Williamsburg Room
Building E-2
Time: 11:30 a.m. to 12:30 p.m.

Mark your calendar

Eastern Shore Blood Drive
at Wallops, July 20, 2004

For further information contact Linda Layton at x1561

Langley's GVSITE Project Begins Today

by Jay Pittman, Chief
Range and Mission Management Office

The NASA Wallops Range and Mission Management Office at Wallops will begin test operations today, June 21, of the NASA Langley Research Center sponsored Synthetic Vision Integrated Test and Evaluation (GVSITE) project.

This project is a part of NASA's goal to develop breakthrough concepts and technologies for aircraft, airspace systems, and air safety and security.

Using an artificial vision, advanced sensors, digital terrain databases, and digital processing, the GVSITE project will demonstrate technologies that will enhance safety by providing a very clear three-dimensional picture of the terrain, obstacles, runway, and traffic regardless of weather conditions.

To test and verify these new concepts and technologies, the project team will be conducting a series of flight tests at Wallops Research Airport.

The testing involves three NASA aircraft in addition to a ground vehicle. The participating aircraft and ground vehicles will be conducting very controlled scenarios to evaluate the ability of the new systems to detect and respond to "near-miss" and other real-life conditions.

During these operations it is especially important for all non-participating personnel to stay clear of operational airport areas while operations are underway.

Flight operations are scheduled June 22 to July 2 and August 2 to August 20. Questions may be directed to Libby West, x2440.

Verizon Wireless

A Verizon Wireless representative will be on site.

When: Wednesday, July 7
Where: Building E-2
Conference Room
Time: 10 a.m. to 2 p.m.

Stop by the Exchange to pick up a list of discounts being offered to Wallops employees.

For more information, contact Karen Thornes at X2040

Inside Wallops is an official publication of Goddard Space Flight Center and is published by the Wallops Office of Public Affairs, Extension 1584, in the interest of Wallops employees. Recent and past issues of *Inside Wallops* also may be found on the NASA Wallops Flight Facility homepage: www.wff.nasa.gov

Editor Betty Flowers